Public Works and Utilities Workshop

Utilities Optimization

July 26,2016

Project Overview

Community Infrastructure and Facilities Status (2012)

- 1/3 of sewer pipes (approximately 655 miles) over 50 years old
- 1/5 of water pipes (approximately 564 miles) over 50 years old
- $1.6 billion in deferred maintenance

Community Investments Plan 2015-2035

- “The funding/financing, maintenance, replacement and enhancement of our public water, sewer and stormwater infrastructure and facilities is a *high-very high* investment need for our community over the long term.”

Project Team

The Utilities Optimization Project is designed to create water and wastewater strategies that incorporate desired levels of service, cost efficiencies and risk management in a way that leads to quality, long-term solutions.

City of Wichita, Kansas

ch2m SM

In Association with:

TRC TABLE ROCK CAPITAL®

Goldman Sachs

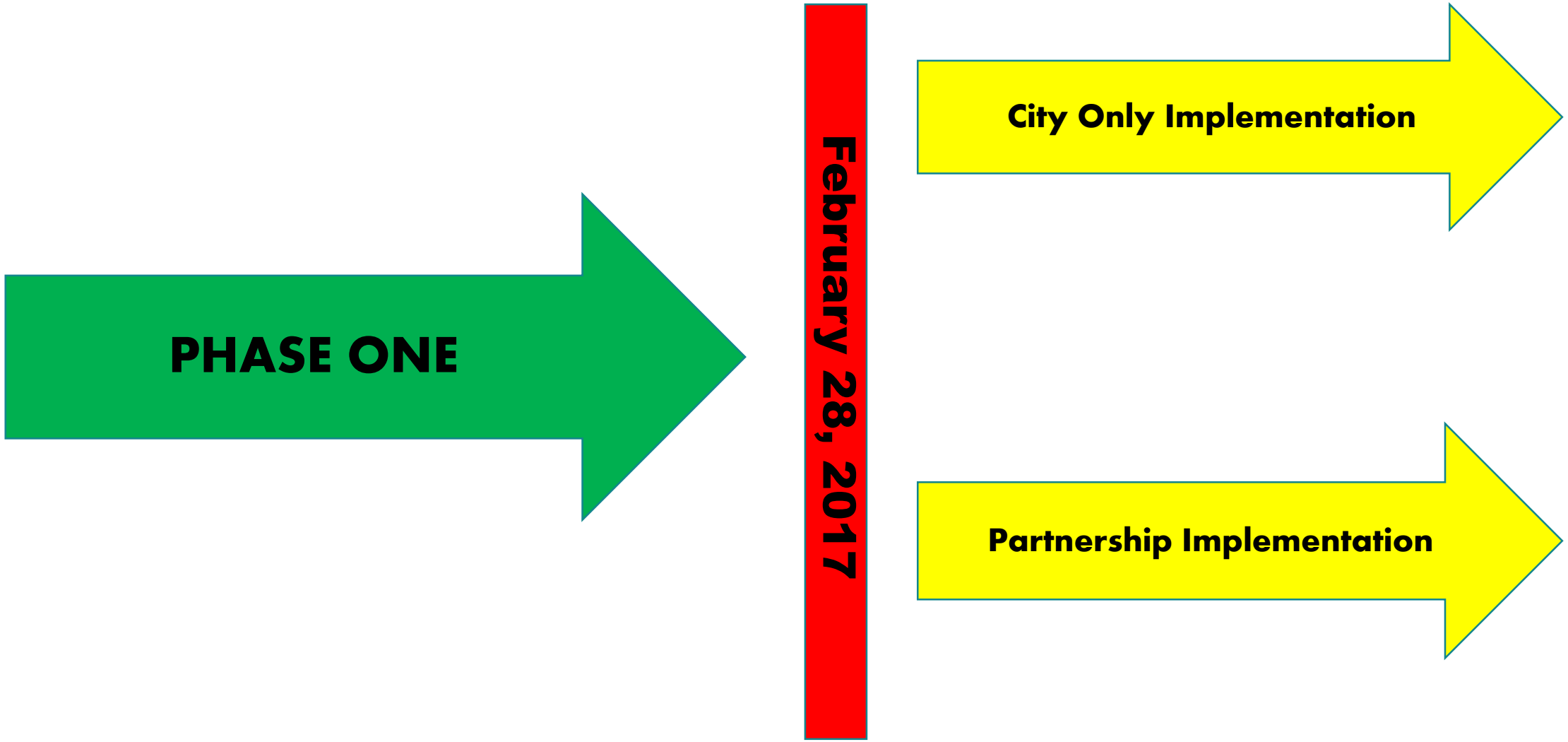
Project Approach

During the past year, Wichita's approach has been profiled at the Aspen Water Institute Summit, West Coast and Inter-Mountain Infrastructure Exchanges and the recent American Water Works Association conference in Chicago, as a model for addressing the nation's need for water and wastewater investment.

Phase One Deliverables

- Formal Asset Management Plan focusing on levels of service and total lifecycle costs.
- Optimized operations and maintenance plan and related implementation plan.
- Funding plan that supports implementation of optimized approaches, may include alternative capital sources.
- Proposed approach to long-term partnership.

Phased Approach



Asset Management – Key Concepts

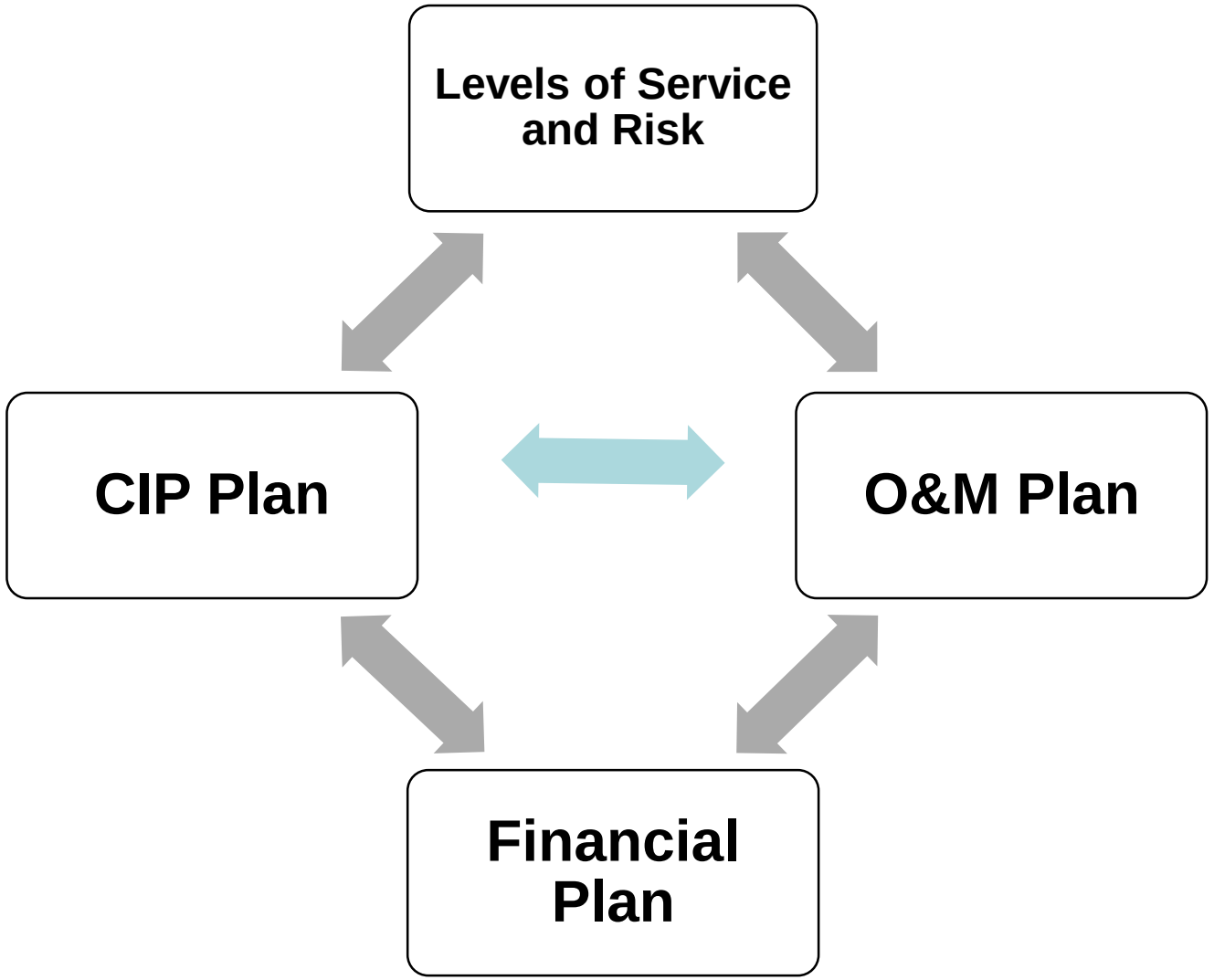
Knowledge of:

- Levels of service
- Assets and their characteristics
- Physical condition of assets
- Performance of assets
- Total cost of asset ownership

Ability to:

- Assess asset risk
- Identify and evaluate risk mitigation options (CIP)
- Optimize O&M activities
- Prioritize options and fund within available budget
- Effectively manage information and employ Decision Support Tool (DST)

Asset Management Plan



- *Meet desired Levels of Service*
- *Lower Total Lifecycle Costs*
- *Lower utility risks*

Levels of Service and Risk

Vertical Assets

- Regulatory Compliance
- System Reliability
- Environmental and Public Health
- Employee Health and Safety
- Public Confidence

Linear Assets

- Fire Capacity (Water)
- Overflow to River (Sewer)
- Supply/Backup to Structures
- Frequency of Repairs
- Other Infrastructure Damage
- All Assets

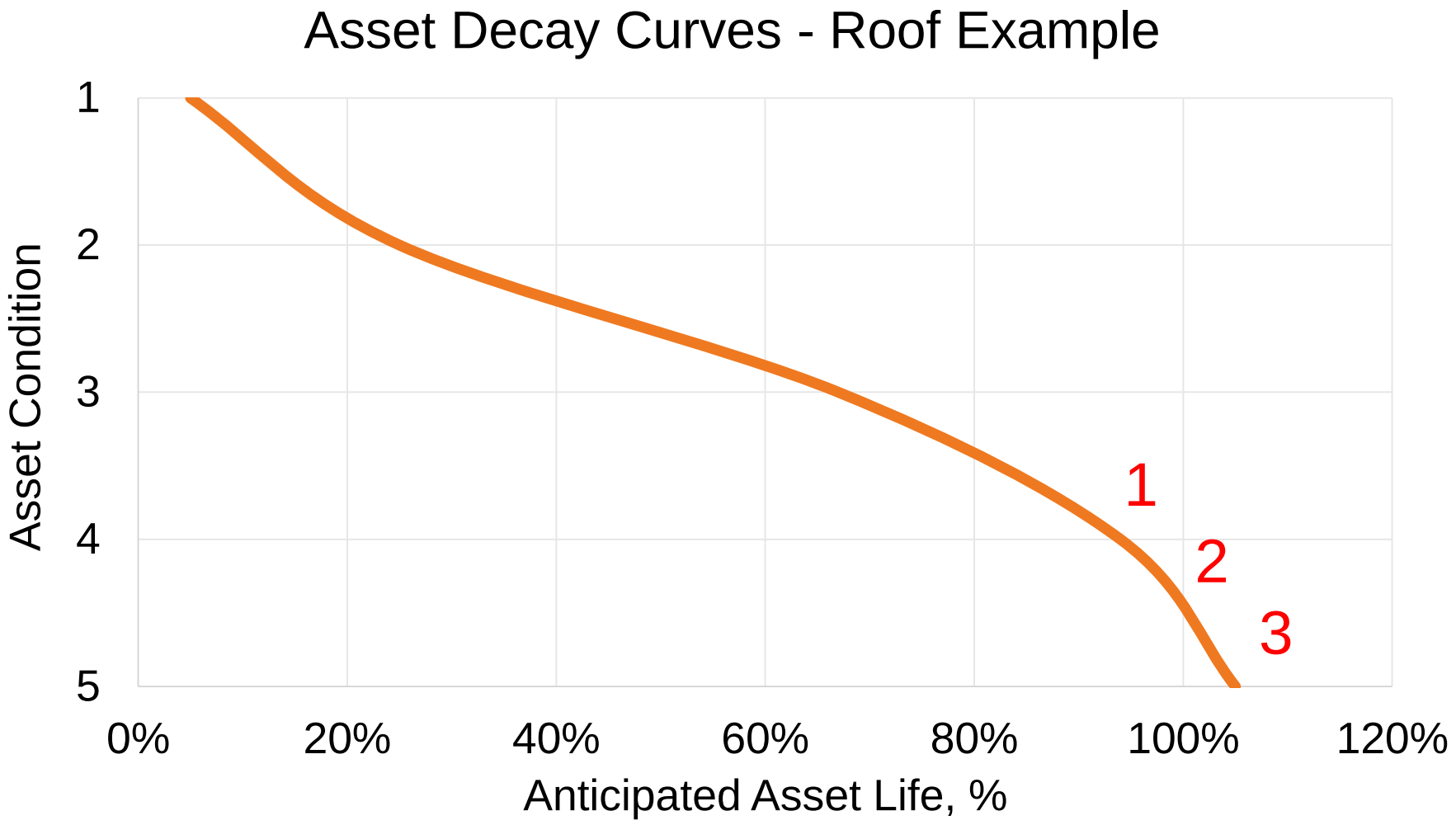
Assets are prioritized based on selecting the levels of service category, location or capacity/size, maintenance strategy, and probability of failure.

CIP Plan

- Utilize DST and asset hierarchy, inventory, condition, and degradation to predict and plan for capital improvements
  - Minimizes reactive investment lowering total investment cost
  - Provides improved investment scheduling and budgeting

- Evaluate improvement needs utilizing standardized Business Case Evaluation (BCE) framework
  - Follows utility vision and levels of service and risk
  - Defendable evaluation process
  - Lowest total cost to utility

CIP Plan

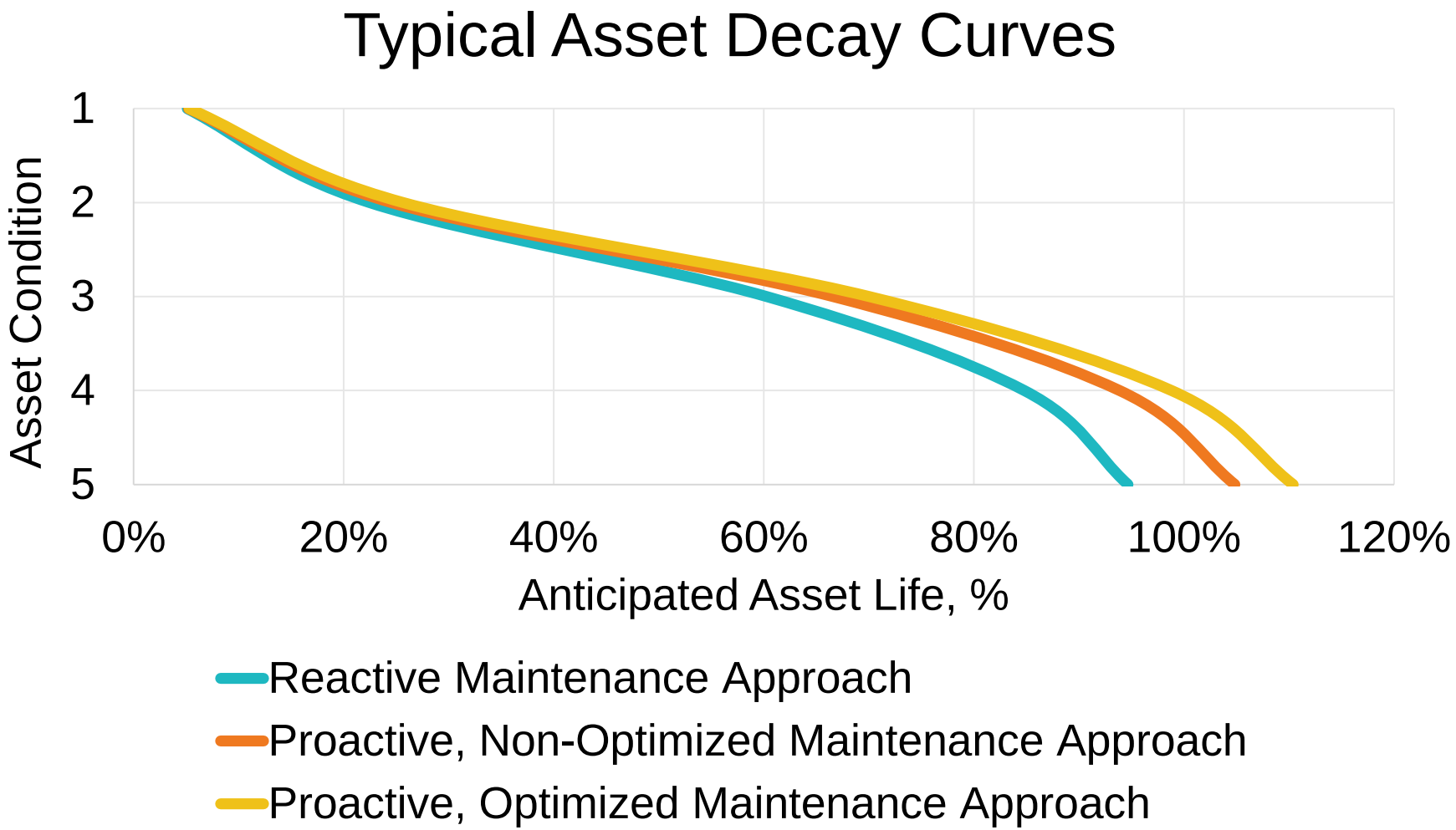


1. Roof about to fail, cost is 100%
2. Roof failed with water damage, cost is 200%
3. Roof failed with water and structural damage, cost is 300%

O&M Plan

- Operations Optimization Analysis
  - Review historic operational data, energy use, chemical consumption
  - Review hydraulic and process modeling data to verify performance
- Preventative Maintenance (PM) Optimization Analysis
  - Evaluate current PM practices to determine suitability and completeness
  - PM goal is to increase equipment reliability at minimal cost
  - Correlate PM activities to asset CIP investment needs
- Organizational and Staff Plan Analysis
  - Is the organization and staff skillset evolving with the industry which is becoming more technology driven and with increased regulatory requirements?
  - Evaluate staff levels and skillsets needed to meet different O&M practices (reactive versus proactive)

O&M Plan

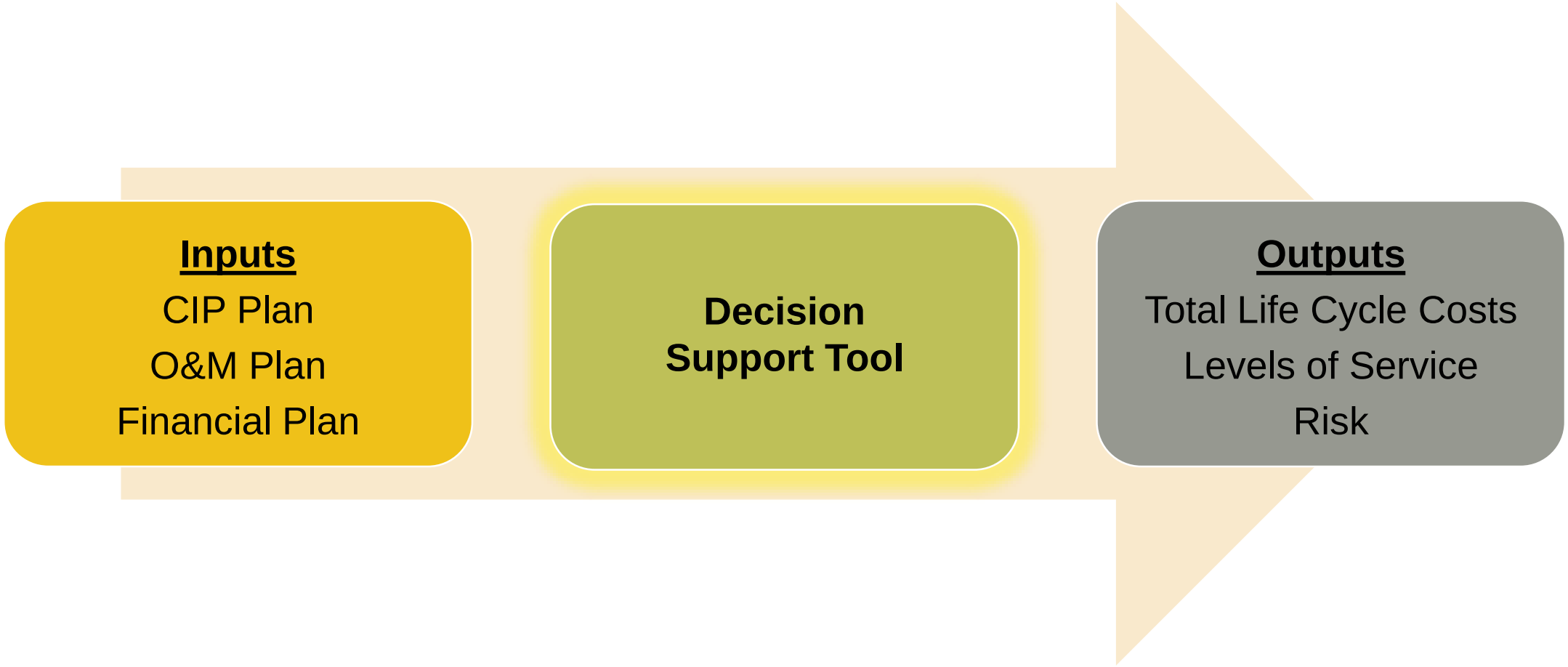


Reactive maintenance approaches typically result in shorter asset life when compared to proactive maintenance approaches.

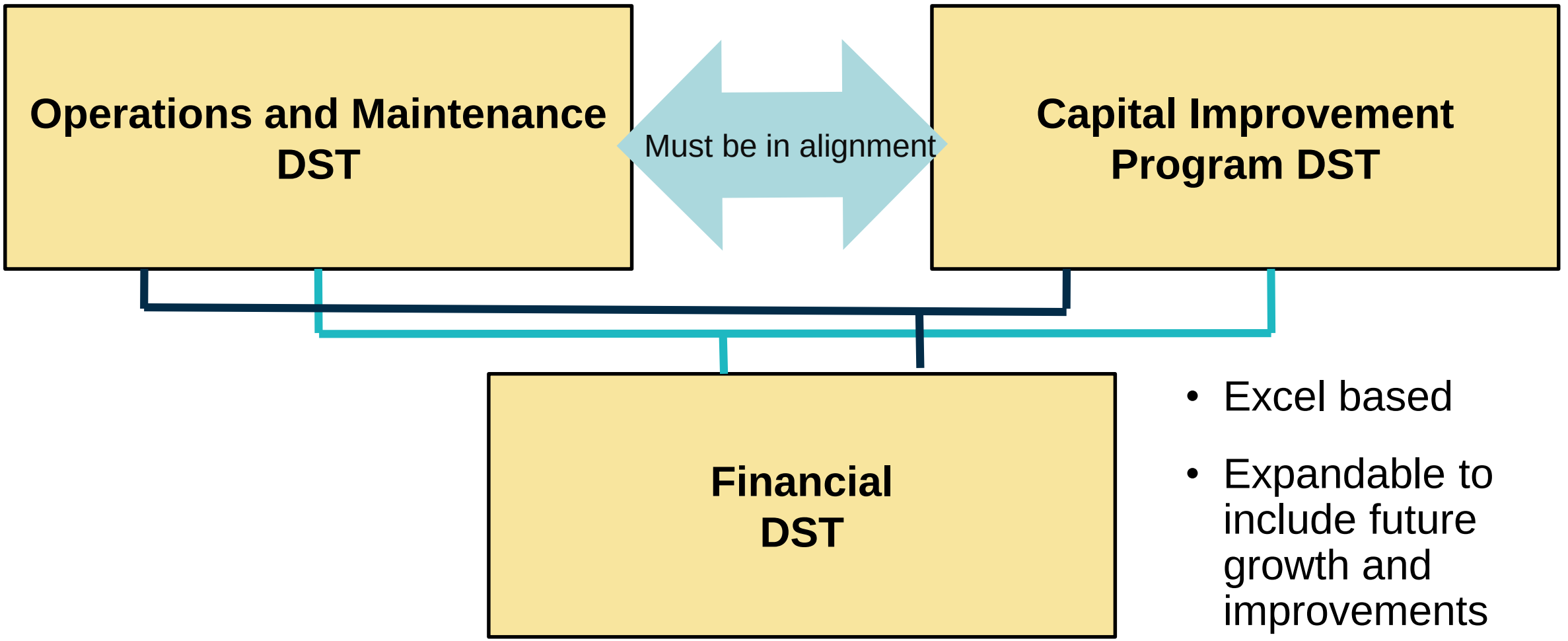
Financial Plan

- Identify optimized CIP investment and operating budgets
- Evaluate the amount and timing of capital projects in relation to previously projected revenues
- Compare traditional revenue bond financing and related bond covenants to potential subordinate debt

Decision Support Tool



Decision Support Tool



- Excel based
- Expandable to include future growth and improvements

Decision Support Tool

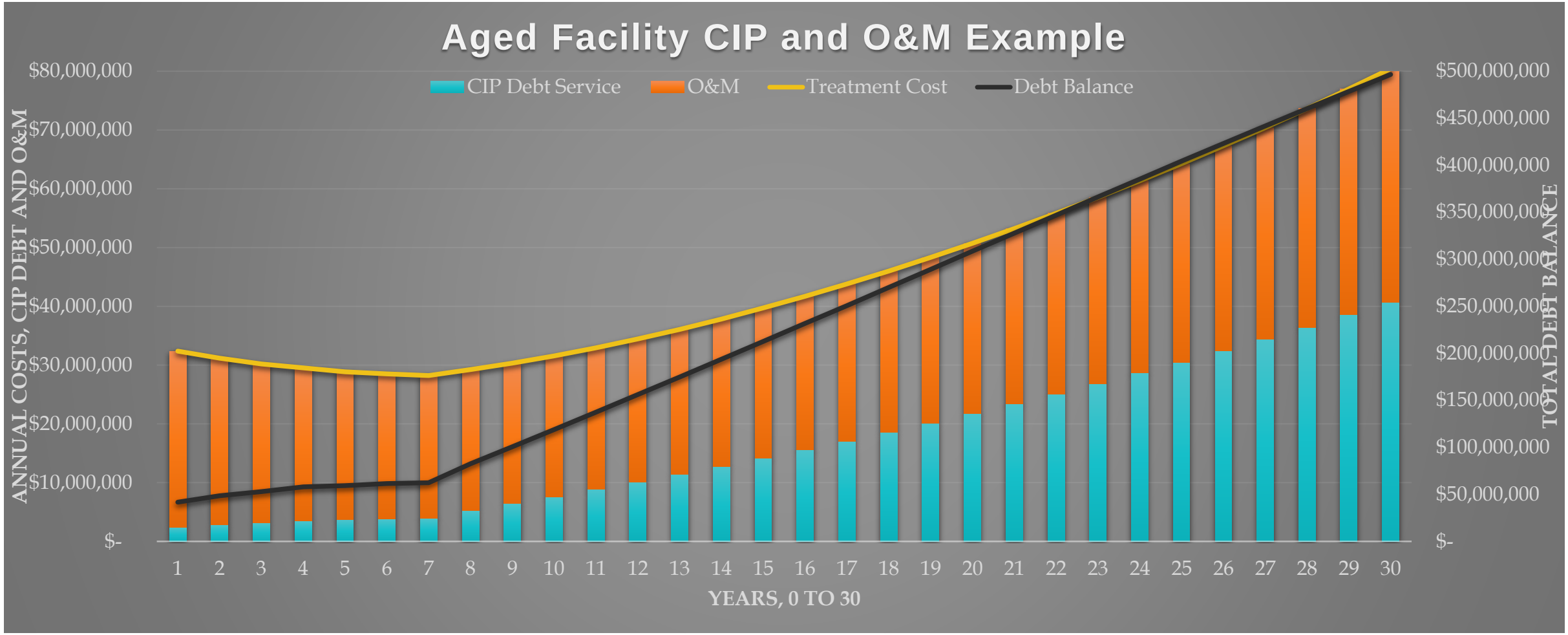
Sewer Collection System example of prioritizing assets based on Levels of Service and other criteria. Selections will help identify assets that should be considered for rehabilitation or replacement.

Priority	Level of Service Category	Tier	Maintenance	Diameter (listed size and greater)	Probability of Failure (listed value and greater)		Number of Assets	Replacement Cost	% of Assets	% of Total System Replacement Value
1	All Assets	1	Proactive	36	90%		1	$ 213,875	0.00%	0.01%
2	Overflow to River	2	Proactive	36	75%		3	$ 492,870	0.01%	0.03%
3	Backup in Structures	3	Proactive	24	50%		52	$ 5,369,507	0.10%	0.32%
4	Frequency of Repairs	4	Reactive	24	90%		8	$ 1,103,470	0.02%	0.07%
5	Other Infrastructure Damage	4	Reactive	12	90%		54	$ 3,702,632	0.10%	0.22%
	Overflow to River Backup in Structures Frequency of Repairs Other Infrastructure Damage All Assets									
Totals							118	$ 10,882,353	0.22%	0.65%

Decision Support Tool

Totals		118	$ 10,882,353	0.22%	0.65%
	Total System Replacement Value		$ 1,666,532,014		
	Loss of Asset Value due to Age		$ 880,982,912		
	Current System Value		**$ 785,549,102**	**Avg. System Prob. of Fail.**	**19.2%**
	LOS Based Asset Reinvestment		$ 10,882,353		
	Loss of Asset Value anticipated this year due to Age		$ (21,764,505)		
	Anticipated System Value Next Year		**$ 774,666,950**	**Avg. System Prob. of Fail.**	**16.8%**

Decision Support Tool



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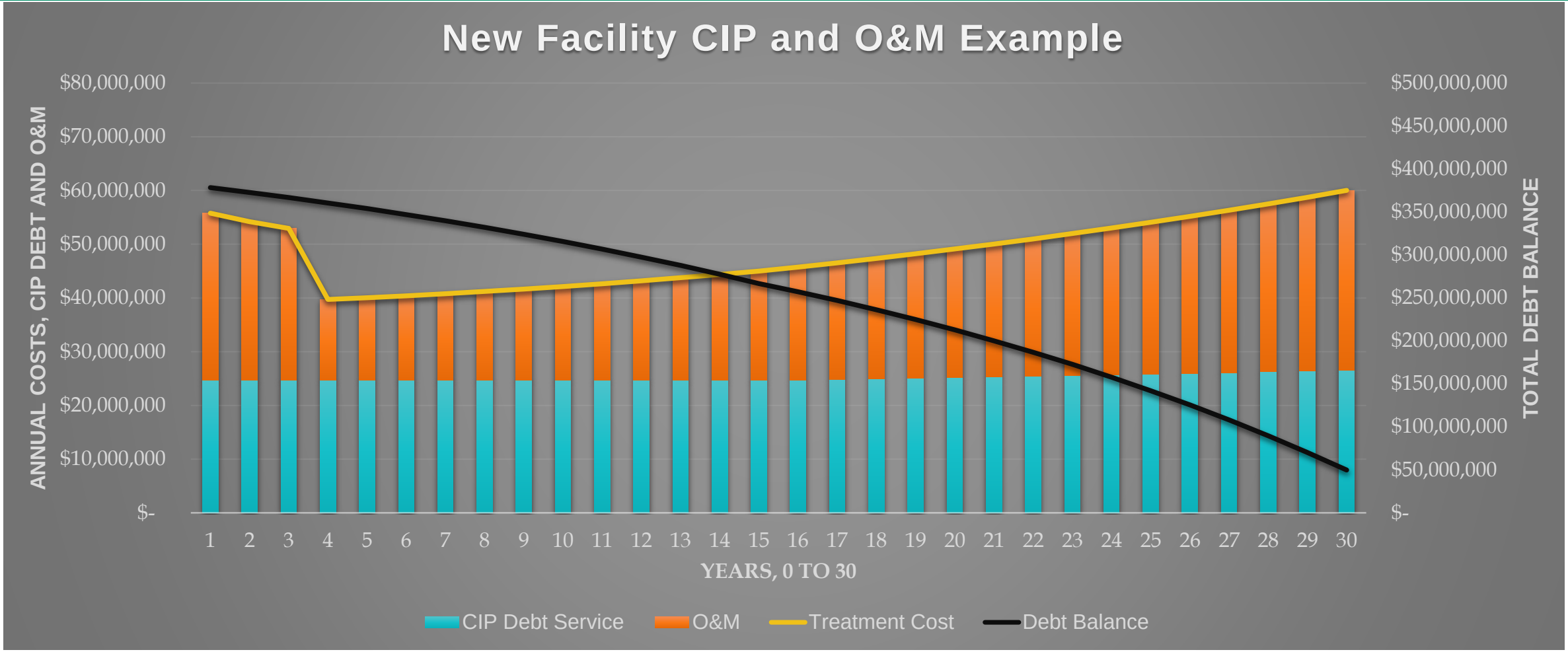
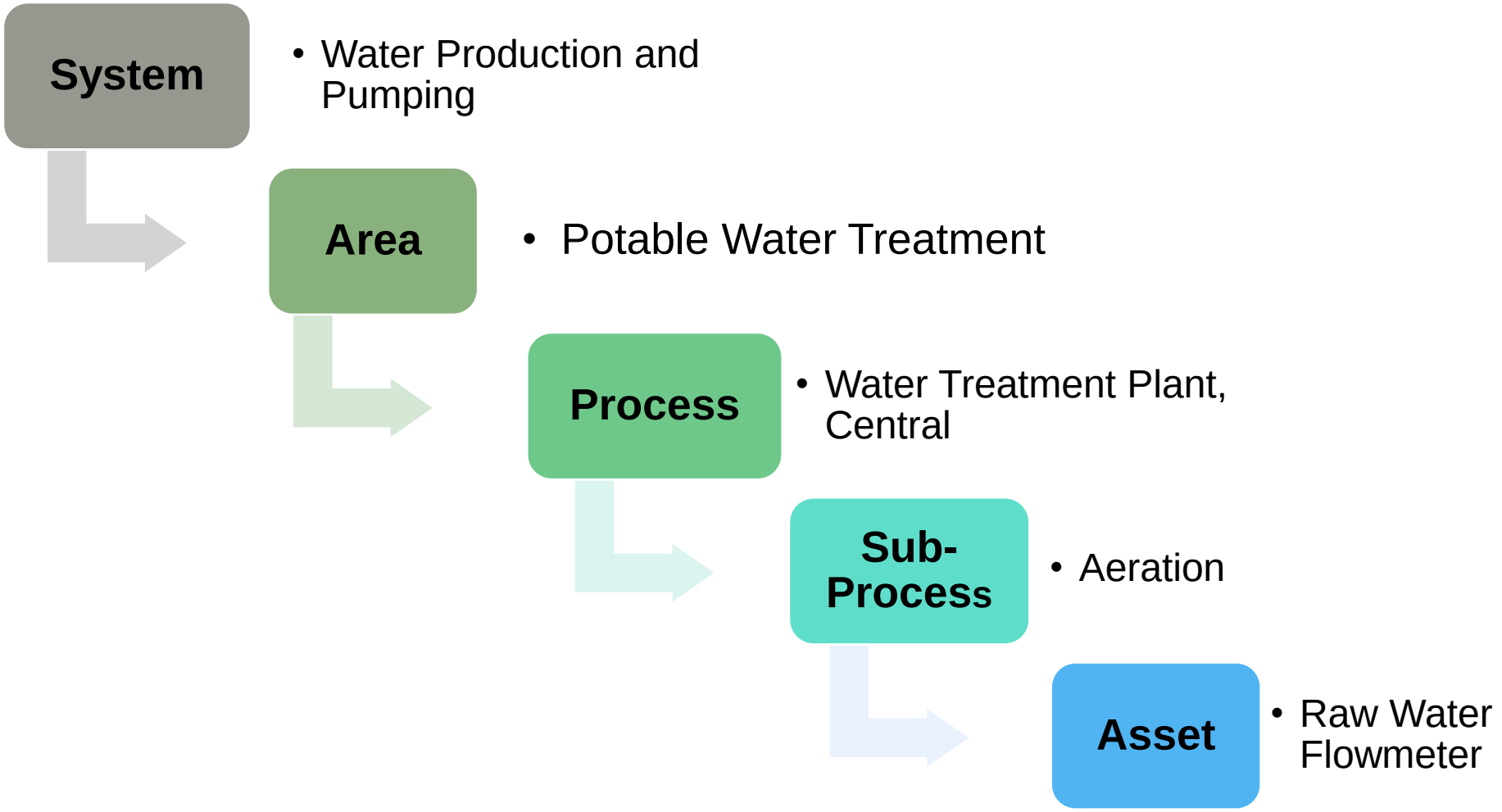
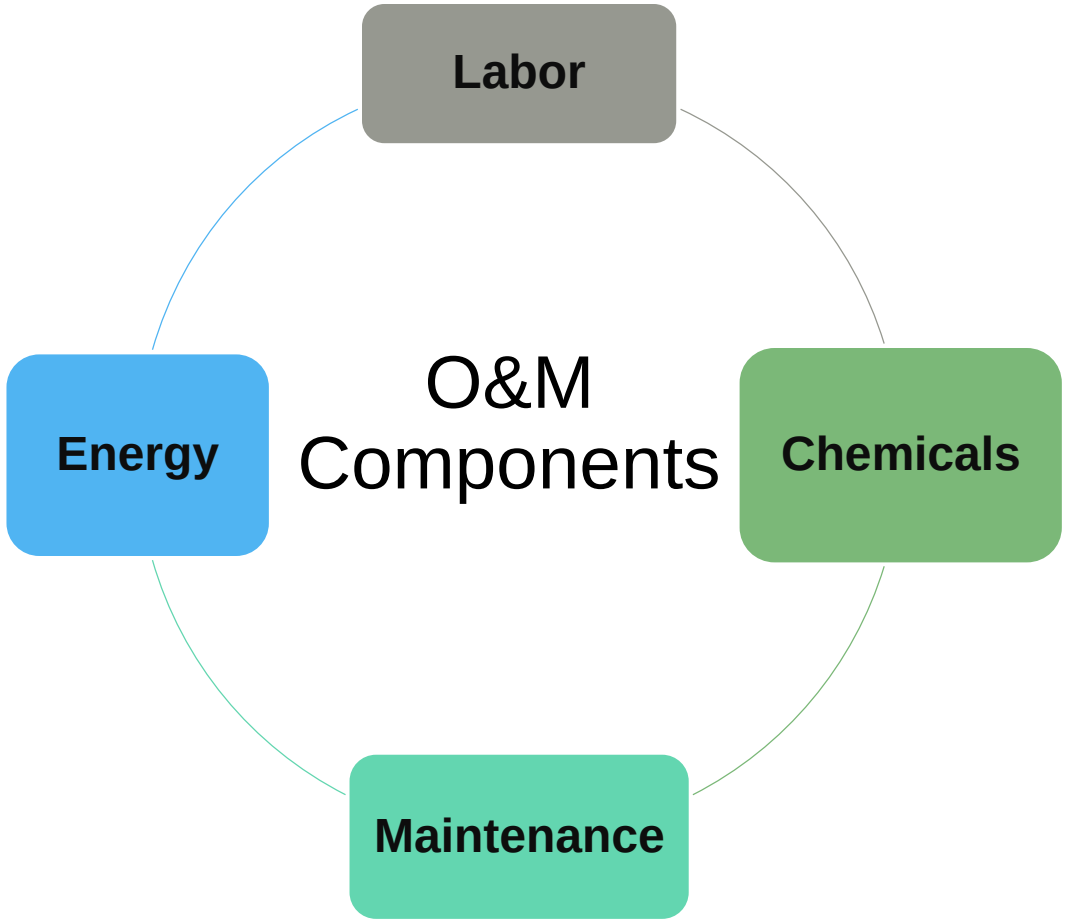


Project Status to Date



- Asset Hierarchy developed
- 10,000 Vertical Assets Identified
- 200,000 Linear Assets Identified
- Data being analyzed for asset condition scoring

Project Status to Date



- Analyzing actual O&M costs versus calculated costs to identify savings opportunities
- Evaluating the impact of process changes through modeling
- Evaluating impacts to costs and asset reliability with varying levels of preventive maintenance

Project Status to Date

- Developed
  - Levels of Service
  - Methods to prioritize assets and risks
- Utility workshops and staff interviews to identify strengths and weaknesses of utility and assets
- Facility tours by Asset Condition and O&M teams
- Several discussions with Bond Counsel and City Financial Advisors to understand financial capacity

Resources for Review

- Phase II decision will be objective and driven by an economic evaluation
- City will work in conjunction with independent third parties to evaluate:
  - Environmental Finance Center, Hugo Wall School, Wichita State University
  - City of Wichita Bond Counsel
  - City of Wichita Financial Advisor
  - Wichita Water Utility Advisory Committee
  - Other technical experts; financial and legal consultants

Decision to Proceed

Status Quo

- Existing CIP
- Existing O&M Plan
- Existing Financial Resources

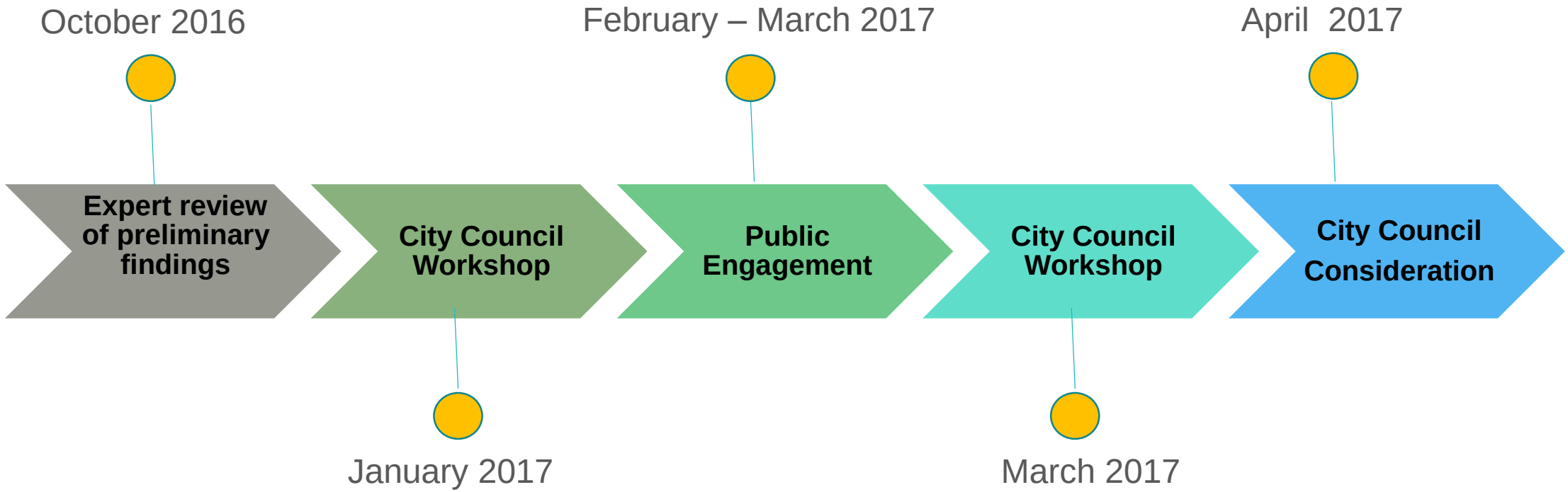
City Only

- Optimized CIP
- Optimized O&M Plan
- Existing Financial Resources

Partnership

- Optimized CIP
- Optimized O&M Plan
- Optimized Financial Resources

Public Engagement Schedule



Public Engagement

- Water Utility Advisory Committee
- SEIU Local 513
- City employees
- Peace & Social Justice Center
- District Advisory Boards
- Wichita Independent Neighborhoods
- Engineering and Public Finance Groups

Team Closing Remarks

- Wichita is engaged in a innovative and potentially high impact evaluation of water and wastewater system rehabilitation and future investment.
- The city is becoming a recognized national leader in evaluating performance based approach to the lifecycle management of its infrastructure.
- Initial Phase I effort indicates the potential for economic efficiency, improvements in levels of service, and reduced risk exposure.
- Ultimately, the team is focused on enhanced outcomes for rate payers over the next generation of city water and wastewater systems.

Public Works & Utilities
Workshop

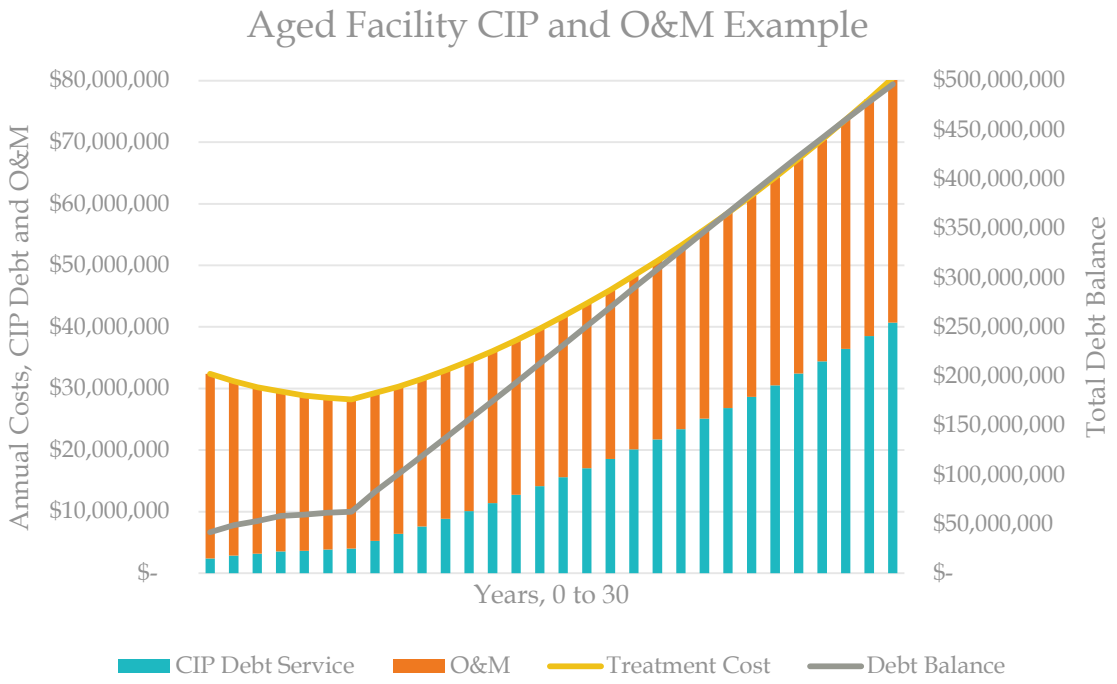
Utilities Optimization

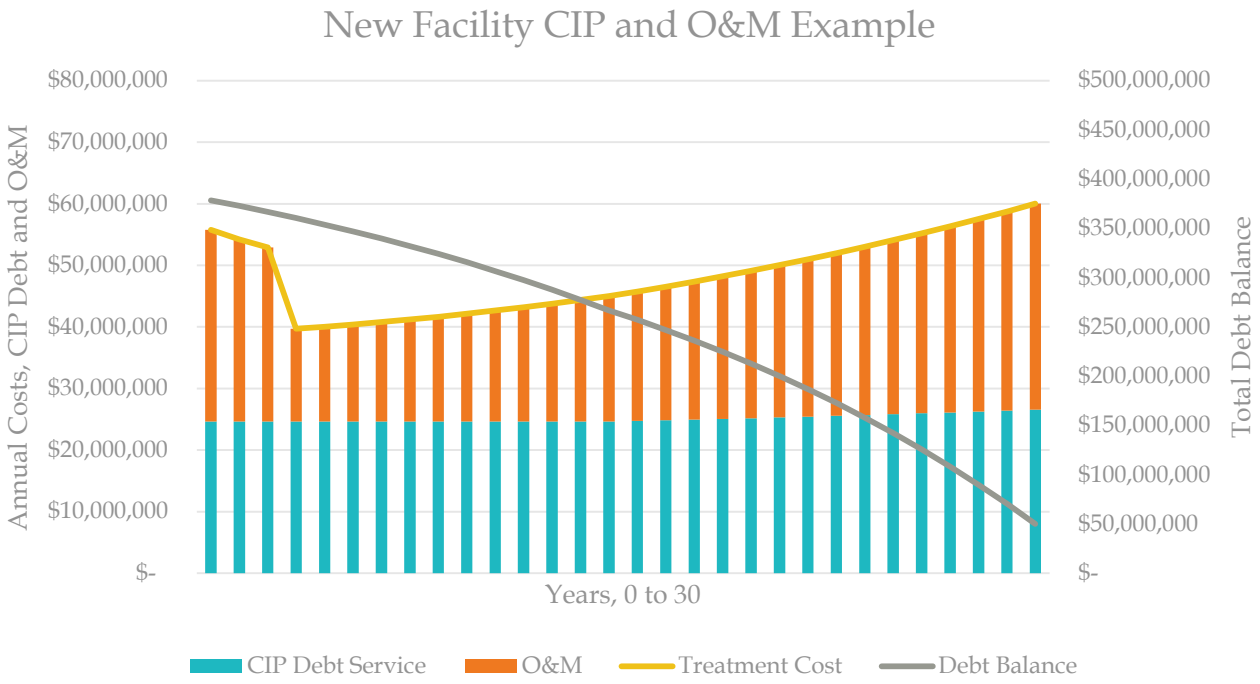
Questions?

CITY OF WICHITA
www.wichita.gov

July 26, 2016

Decision Support Tool





- Initial versus long-term costs
- Lifecycle costs and rate variability
- Risks of meeting Levels of Service